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09/977,339	10/16/2001	Nobuko Okada	110891	1640

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EXAMINER

NGUYEN, LAM S

ART UNIT	PAPER NUMBER
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2853

DATE MAILED: 04/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/977,339

Applicant(s)

OKADA ET AL.

Examiner

LAM S NGUYEN

Art Unit

2853

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 31 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

#### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted element is a regulator that regulates each group of piezoelectric elements.

#### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-5, 7-8, 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sando et al. (US 6210245) in view of Takeoshi et al. (US 5157411).

Sando et al. disclose an ink jet recording apparatus comprising:

a plurality of nozzles for discharging a functional liquid on a functional liquid applied substrate (FIG. 2 and Abstract: an ink jet device having plural nozzles for delivering a solution containing a material for conductive film) (**Referring to claims 10, 12**);

a mounting table (FIG. 1, element 9); and

a substrate (FIG. 1, element 61);  
wherein discharge quantity and flight speed of said functional liquid discharged from said nozzles is regulated by voltage level applied to piezoelectric elements (column 3, line 30-34: “dispensing of the material can also be done well by dispensing the material by a piezoelectric device”) corresponding to said nozzles such that the impact position of the functional liquid on the substrate becomes hard to be displaced even when moving the mounting table at higher speed (column 21, line 6-15: “The voltage of driving pulse was adjusted for each nozzle so that the delivery amount of nozzle 7b-7d became 50pl. This adjustment made the nozzles 7b to 7d discharge the same amount of droplet as the nozzle 7a”). Because droplets having different amount fly in different speeds, by regulating the amount of ejecting droplets, the flight speed of droplets are also regulated. In addition, by ejecting the same amount of droplets to eliminate the variation in the quantity of droplets, the impact position is hard to be displaced).

Sando et al. do not disclose wherein said plurality of nozzles is divided into a plurality of groups the number of which is fewer than the number of said nozzle, wherein each group contains nozzles located next to each other. In addition, even though Sando et al. disclose regulating the discharged amount from said nozzles by applying different voltage level for a printing element, Sando et al. do not disclose regulating the discharged amount from said nozzles by applying different voltage level for at least two groups of the plurality of groups (**Referring to claims 13-14**).

Takekoshi et al. disclose a recording head having a plurality of arranged recording elements and corresponding nozzles, wherein plurality of nozzles (FIG. 1: a corresponding nozzle for each RECORDING ELEMENT) is divided into a plurality of groups (in term of

“block”) the number of which is fewer than the number of the nozzles (FIG. 2: four blocks and 16 nozzles), wherein each group contains nozzles located next to each other (FIG. 1: nozzles corresponding to RECORDING ELEMENT 2-1 to RECORDING ELEMENT 2-n located next to each other or FIG.2: nozzles corresponding to recording elements 1-4 in block B1 are located next each other), wherein the amount of ink ejected from the nozzles in each group of nozzles is regulated by applying different ejection waveform to each group of recording elements (FIG. 1: each block of recording elements is driven by a different ejection waveform provided from elements 4-1, 4-2, ...) so the diameters of dots of a recorded picture image can be corrected as a whole (column 3, line 1-3).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the ink jet apparatus disclosed by Sando et al. such that dividing nozzles into a plurality of groups wherein the liquid discharged from said nozzles is regulated for each group as disclosed by Takekoshi et al. The motivation of doing so is to provide a recording head wherein the recording characteristics of the respective recording elements are corrected so as to prevent thickness unevenness as taught by Takekoshi et al. (column 1, line 40-46).

**In addition, Sando et al. disclose the following claimed invention:**

**Referring to claims 5, 8:** wherein positions on ink jet head on which said plurality of nozzles is arranged are divided into a plurality of areas, and nozzles belonging to each area are made to belong to a single group (FIG. 9).

**Referring to claims 2-4, 11:** wherein said functional liquid is an electrically conducting particle dispersion solution that is usable to manufacture a substrate comprising a conducting

wiring pattern (FIG. 14-15). In addition, the limitations "wherein said functional liquid is ink that is usable to manufacture a color filter" (or an electro-optical apparatus), "said functional liquid is a solution of electroluminophor that is usable to manufacture an EL element substrate", or "wherein said functional liquid is an electrically conducting particle dispersion solution that is usable to manufacture a substrate comprising a conducting wiring pattern" (**Referring to claims 2-3**) are noted but not given patentable weight because it is well settled that material or article worked upon does not limit apparatus claims. See Ex parte Thibault, 164 USPQ 666, 667, (Bd. App. 1969) ("Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim.") or In re Young, 25 USPQ 69 (CCPA 1935) (as restated in In re Otto, 136 USPQ 458, 459 (CCPA 1963) ("Inclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims."). (MPEP 2115 Material or Article Worked Upon by Apparatus).

2. Claims 6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sando et al. (US 6210245) in view of Takeoshi et al. (US 5157411), as applied to claims 1 and 7, and further in view of Imanaka et al. (US 6409300).

Sando et al., as modified, disclose the claimed invention as discussed above and wherein said ink jet head on which said plurality of nozzles is arranged comprises cavities (FIG. 11, element 224) provided for each of nozzles (FIG. 11, element 225), a reservoir (FIG. 1, element 228) communicating to said cavities and common to said nozzles, and a supply port (FIG. 1, element 2210) for supplying said functional liquid to said reservoir.

However, Sando et al., as modified, do not disclose wherein said plurality of groups comprise at least a first group comprising nozzles of said plurality of nozzles positioned close to

said supply port, and a second group comprising nozzles of said plurality of nozzles positioned far from said supply port.

Imanaka et al. disclose a structure of a ink jet head (FIG. 9) having cavities 2020 provided for each of nozzles 400, a reservoir 2010 communicating to the cavities and common to the nozzles, and a supply port 2040 for supplying ink to a reservoir, wherein the nozzles are divided into plurality of groups having at least a first group comprising nozzles of said plurality of nozzles positioned close to the supply port, and a second group comprising nozzles of said plurality of nozzles positioned far from the supply port (column 3, line 56-63: "a structural variance in the area of the orifice openings" means that the ink supply paths of groups of nozzles corresponding to the middle part or the end parts of a jet head are different in distance).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the structure of the printhead disclosed by Sando et al., as modified, such that arranging the first group of said plurality of nozzles positioned close to the supply port and the second group of said plurality of nozzles positioned far from the supply port as disclosed by Imanaka et al. The motivation of doing so is to provide a printing method and apparatus in which pinning is performed while correcting for variance of individual printing elements as taught by Imanaka et al. (column 4, line 64-67).

#### ***Response to Arguments***

Applicant's arguments with respect to claims 1 and 7 have been considered but are moot in view of the new ground(s) of rejection.

#### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S NGUYEN whose telephone number is (571)272-2151. The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, STEPHEN D MEIER can be reached on (571)272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR



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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LN

April 9, 2004

*Hai Pham*  
HAI PHAM  
PRIMARY EXAMINER